

Notes on a few Gomphidae from the Indo-Australian Archipelago, with descriptions of new species and larvae (Odon.).

by

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With 7 text-figures.

In this paper I propose to give the results of a closer examination of some East Asiatic *Mesogomphus* and of the species *modestus* of *Onychogomphus*, all recently acquired additions to the Buitenzorg Museum collection, combined with such observations as had been previously made from other material belonging to these genera existing in the Brussels Museum, formerly DE SELYS' collection, and in that of Dr. F. F. LAIDLAW, of Uffculme, Devon.

Genus *Mesogomphus* Förster.

Only four species, including one from the Malay Peninsula, have so far been recorded from the entire Indo-Australian Archipelago. These species are *capricornis* (FOERSTER) from Malaya, *reinwardti* (SELYS) from Java, *flavohamatus* (MARTIN) from Flores (and doubtfully also Boeroe and Lombok), and *capitatus* (MARTIN) from Celebes.

To these I am now able to add two further representatives, recorded from regions whose Odonate-fauna is still very incompletely known. Besides, a more ample description is given of MARTIN'S *Onychogomphus flavohamatus*, based upon a pair from the typical locality. The newly described, or re-defined, species and subspecies, incorporated in the following pages, are :

<i>M. reinwardti reinwardti</i> (SELYS)	Java.
<i>M. reinwardti simplex</i> , ssp.n.	Sumatra.
<i>M. flavohamatus</i> (MARTIN)	Flores.
<i>M. tachyerges</i> , sp.n.	Soemba.

The principal characters of *M. capitatus*, as given in the species, are borrowed from MARTIN'S original description.

1. Yellow mesothoracic half collar broadly interrupted in

the median line. Narrow, elongate, antehumeral stripes on either side above short and isolated, not joined below with the mesothoracic half collar. All pale markings of synthorax sharply delimited, ground-colour throughout jet-black. Costa black in front (*capitatus* uncertain).

2. Ground-colour of thoracic sides yellow, with two complete black stripes. Segm. 8—9 of abdomen black, except two yellow spots on the foliate dilatations of 8 and one on that of 9. Inferior anal appendage half as long as superior pair, in profile view upwardly curled, in ventral view deeply divided, forming two branches. Abd. 40, hind wing 30 mm. Hab.: Celebes *capitatus*.

2'. Ground-colour of thoracic sides jet-black, marked with bright green or yellow as appears from fig. 3d. Segm. 8—9 of abdomen orange with black markings; foliate dilatations orange, bordered with black behind. Inferior anal appendage only one-third to almost one-fourth as long as superior pair, in profile view only slightly upwardly bent, in ventral view with a very narrow incision apically (fig. 6). Insect of slender build. Abd. 35—37, hind wing 25—28 mm. Hab.: Soemba Is. *tachyerges*, sp. n.

1'. Yellow mesothoracic half collar whether or not interrupted in the median line. Dorsal thoracic antehumeral stripes longer and wider, almost or broadly joined below with the mesothoracic half collar, forming 7-shaped markings. Pale colours of synthorax usually less sharply pronounced, ground-colour of the sides at least partly brown. Inf. anal appendage in profile view strongly upwardly curved. Insects of more compact building.

2. Face bright orange with dark markings much reduced: labium unmarked, transverse portion of T-shaped black spot restricted to the middle of frons. Mesepisterna jet-black, with thick, oblique, longitudinal antehumeral bands, scarcely widened above and broadly connected below with the transverse portion of same, forming very definite 7-shaped markings. Transverse portion of smae well separated in the middle line. Metepisterna conspicuously marked with yellow (fig. 3c). Costa black in front. Tenth abdominal segment and anal apps. throughout bright orange. Inf. app. only slightly notched apically (fig. 5). Flores Is. *flavohamatus*.

2'. Face pale orange or yellow with dark markings well developed: labium at least with dark brown or black basal line; transverse portion of T-shaped dark spot complete, joining with the black colour at base of frons on either side near the margin of compound eye. Mesepisterna dark velvet-brown, with oblique longitudinal antehumeral stripes more or less ovate and just separate from, or only very narrowly connected with the transverse portion of same, forming less

pronounced 7-shaped markings. Transverse portion of same scarcely separated in the middle line. Metepisterna whether or not spotted with yellow. Costa at least partly yellow in front. Tenth abdominal segment and anal apps. for the greater part, or entirely, black. Inf. app. deeply incised apically.

3. Abdomen less slender and comparatively shorter (32—33, hw. 25—26 mm). Thorax a little narrower. Humeral stripes reduced to a vestigial dorsal point and a barely visible, pale brownish, line along middle of humeral suture (absent in one male). Lateral thoracic stripe on metepisterna reduced to similar minute point close to the upper margin, or wholly absent (fig. 3b). Pale markings on dorsum of abdominal segments 8 and 10 reduced to obscure traces. Hab.: Sumatra *reinwardti simplex*, subsp. n.

3'. Abdomen slenderer and comparatively longer (33.5—36, hw. 24—26 mm). Thorax more robust and a little wider. Humeral stripes narrow but well defined and always present, in most specimens shortly interrupted in their dorsal third, forming a conspicuous, isolated, subtriangular dorsal spot, and a narrow yellow line running close to the humeral suture. Lateral thoracic stripe on metepisterna well pronounced, wider than humeral lines, mostly broken up in the middle, forming two more or less isolated yellow spots, sometimes entire and rather vermiculate in appearance (fig. 3a). Pale markings on dorsum of abd.-segm. 8 and 10 conspicuous: darkest specimens with at least one large, rounded, apical yellow spot on middle of segm. 10. Hab.: Java ... *reinwardti reinwardti*.

Mesogomphus reinwardti reinwardti (SELYS)

(LIEFTINCK, Tijdschr. Ent. 72, 1929, pp. 136—139, figs.)

So far as our present knowledge goes this species is confined to Java. A description and figures of external characters have been given in a previous paper, the male being still unknown at that time. Specimens of that sex were taken in South Java by Mr. DRESCHER. Since then I have come across typical *reinwardti* myself in several localities in West Java and also met with the opportunity of examining a good series of females.

It is apparently a very local species, only found in limited numbers where it occurs and possibly only on the wing during a short period of the year. My records are from October until the end of January (wet season), and from April until the middle of July (dry season). The highest recorded altitude is ca. 850 m above sea level (Mt. Slamet), but it is most commonly met with in low country. The males settle on stones in the streambed and, owing to their cryptic colouring, are very hard to detect in resting position.

In my description and figure of the penis of adult *reinwardti* (loc. cit. fig. 29, p. 139), the shape of the distal portion of that structure has erroneously been called „shovel-

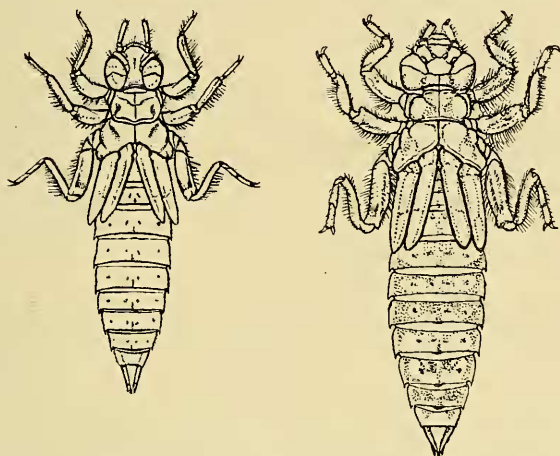


Fig. 1. *Mesogomphus lineatus* (SELYS), exuvia from Chota Nagpur (left), and *M. reinwardti reinwardti* (SELYS), same from Java (right). Drawn to scale ($\times 2$).

shaped". The long curled filaments on either side of the truncated apex have been overlooked and therefore it was though advisable to add a better figure of it on this occasion, drawn from a second specimen (fig 4).

Larva. — As was pointed out so very well by KJELLANDER, the larva of *Mesogomphus* differs markedly from that of *Onychogomphus* by the structure of the labium, the antennae and the caudal appendages. For morphological details not especially mentioned hereafter, the reader is referred to ANDER's paper on the larva of the N. African *M. hageni* (SELYS) in „Konowia", 8, 1929, Heft 2, pp. 159—162, figs. 1—4.

Two exuviae and a few imagoes were found on the sandy foreshore of a small rocky stream in the Botanic Garden at Buitenzorg, early in the morning of Jan. 18, 1931. In general aspect the larva is very similar to that of *M. lineatus* (SELYS) of which Dr. LAIDLAW sent me a exuvia from India. This was bred in the laboratory by the late Dr. ANNANDALE in Calcutta, the cast skin with freshly emerged imago bearing the following labels: — Sanjai River, Chakradharpur, Chota Nagpur, 8—10. II. 1918; in soft mud in sluggish stream, N. ANNANDALE leg. Adult (♀) emerged in Calcutta on 21. II. 1918, N. A. & F. G. — No. 7934/HI.

Dr. FRASER has described the supposed larva of *M. lineatus* from material collected by himself near Coorg, India. On reading over his description, however, it is at once evident

that his notes do not apply to genus *Mesogomphus* at all, and I am unable at present to locate his nymph from the description only. For this and other reasons I have

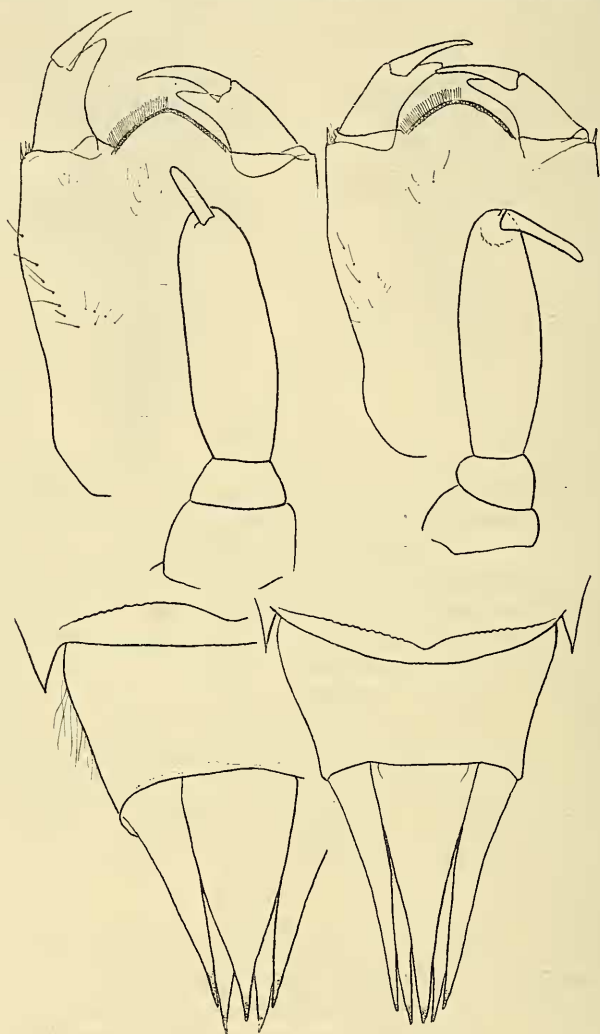


Fig. 2. *Mesogomphus lineatus* (SELYS) and *M. reinwardti reinwardti* (SELYS). Larval structures.

Interior view of labium, antenna, and anal pyramid of *reinwardti* (left), the same of *lineatus* (right).

thought it necessary to make drawings of the larval structures of both species of oriental *Mesogomphus*, showing that FRASER's identification is incorrect. (FRASER, Indian Dragonflies, pt. 18, J. Bom. Nat. Hist. Soc. 29, p. 993): Our two species are easily distinguished in the nymphal stage by the following characters.

reinwardti (Java)

Length of body 26—28 mm.

Abdomen more compactly built, less pointed behind ;

Head 5 mm wide ;

Third joint of antennae almost four times longer than fourth joint (fig.)

Anal pyramid twice longer than tenth abdominal segment (fig.)

lineatus (India)

Length of body about 23 mm.

Abdomen slender, more pointed towards apex ;

Head scarcely 4 mm wide ;

Third joint of antennae less than three times longer than fourth joint (fig.)

Anal pyramid about two and a half times longer than tenth abdominal segment (fig.)

The labia of the two species are very similar and agree in all essential points with that of *hageni*, described by ANDER.

The body of the single exuvia of *lineatus* is throughout pale yellowish in colour, with the abdominal markings ill-limited and much reduced. The skins of *reinwardti* are darker, ochreous brown, showing a more pronounced pattern of more or less confluent brownish spots. The figures should be consulted.

Mesogomphus reinwardti simplex, subsp.n.

Material examined : — Two males (adult), Sumatra mer., Benkoelen, Banding Agoeng, 27. X. 1929, „at lamp”, C. G. VAN STEENIS leg. One female (ad.), N. E. Sumatra, Deli, Medan, VII—VIII. 1928, J. C. VAN DER MEER MOHR leg.

Male (ad., B. Agoeng). — Labium pale yellowish, tips of lateral lobes darkened. Mouth-parts and face pale greenish or bluish white ; labrum with a broad but ill-defined basal streak of brown and a very narrow line along anterior margin. Genae pale in colour. Mandibles blackish brown, with a large pale spot in the centre at base. Anteclypeus unmarked, postclypeus with a diffuse crescent-shaped transverse brown fascia along the middle of the anterior margin. Vertical portion of frons dark brown, as is also the upper surface, but there are two very large, green spots situated on either side of the dark median stripe, rounded behind and bordering the anterior ridge of frons which along margin is provided with two irregular lateral groups of black granulations (about 7 in number). Vertex projecting in a low, anteriorly convex ridge just behind the ocelli ; dark brown with three minute yellowish points, one on each side of the lateral ocelli, and one behind the median ocellus. Antennae black. Eyes olive-brown. Occipital plate bright yellow, its free margin slightly concave, pilose, and provided with ca. 6—8 minute black

teeth. Occiput black, with the usual pale band along the compound eyes below, but without supplementary yellow spot further inwards (always present in *r. reinwardti*).

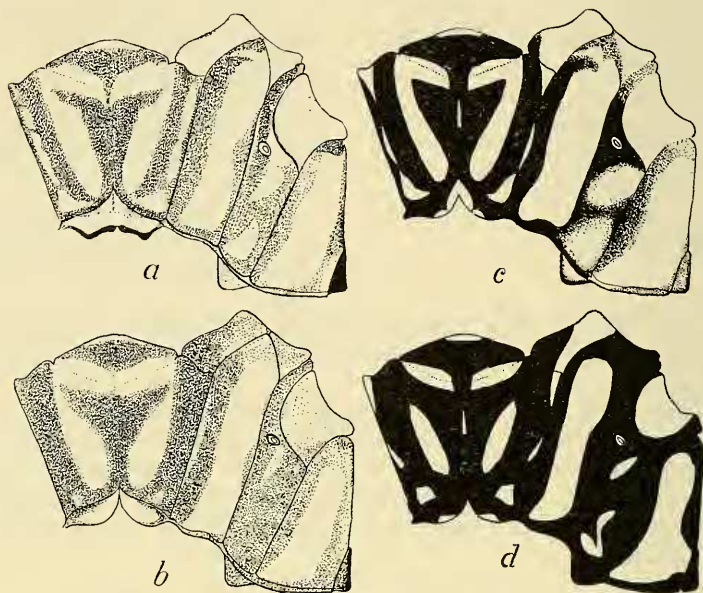


Fig. 3. Diagrams of thoracic colour-pattern (males) of a *Mesogomphus r. reinwardti* (SELYS). Java; b. *M. r. simplex* m., S. Sumatra; c. *M. flavohamatus* (MARTIN), Flores; d. *M. tachyerges* m., Soemba.

Prothorax velvet-brown, with small yellowish spots on anterior lobe. Ground-colour of synthorax deep velvet purplish-brown, paler below; marked on the upper surface and along sides with clear greenish yellow bands, as is shown on the figure. Venter brownish with indefinite yellowish markings behind on poststernum. Coxae pale behind.

Legs black; femora brownish yellow except a black interior line and a diffuse blackish ring at apices of third pair. Knees with a small yellow spot. Tibiae of first pair striped with yellow exteriorly.

Wings subhyaline, or slightly washed with yellow all over the membrane. Nodal index variable: antenodals $\frac{12-15}{9-10}$, postnodals $\frac{6-7}{8}$. Pterostigma shorter than in typical *reinwardti*, scarcely 3 mm long, deep black in colour and less widened in the middle. Neuration blackish brown, costa finely yellow.

Abdomen short and compact, terminal segments more abruptly widened than in *r. reinwardti*. Black, marked vividly as in the typical race but all colours darker, deep orange, except the spots along sides of segm. 1 and 2 which are clear

greenish yellow, not confluent but well separated from each other by a transverse dark brown stripe crossing the auricles, which themselves have only a yellow point above. Dorsal orange markings on segm. 3—7 similar to *r. reinwardti* but less oblique and a little wider laterally. Segm. 8 almost entirely black, with the articulation, small diffuse paired spots on dorsum at base, and a rounded sub-basal dot along sides, dull orange; foliaceous dilatations decidedly narrower and more produced than in typical *reinwardti*, black with minute ochreous point at base. Segm. 9 entirely black above, sides with a large bright orange marking covering also the foliate dilatations. Segm. 10 black with two diffuse dorsal points along base and a narrow, transverse, orangish apical line; sides either black or with an orange point.

Anal appendages jet-black. Superior pair a little shorter than in typical *reinwardti*, thicker at base, and perhaps more evenly curved downward. Inferior appendage scarcely different (fig. 4).

Genitalia. No differences in the shape of the accessory genitalia with typical *reinwardti* could be traced. (See for *M. r. reinwardti* fig. 29, LIEFTINCK, loc. cit. and fig. 4 of this paper).

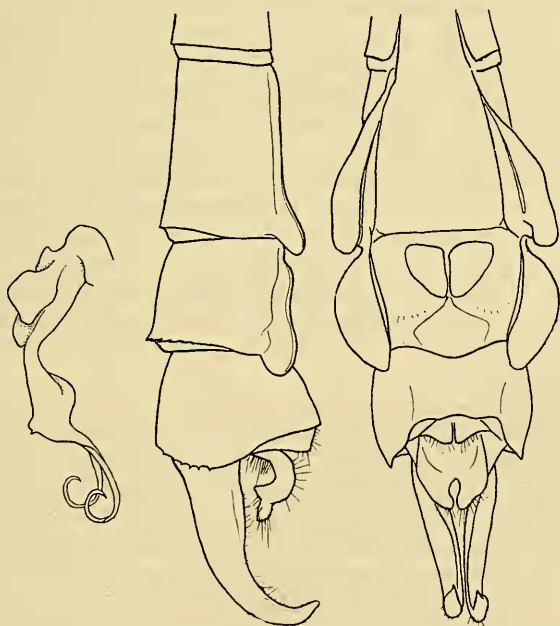


Fig. 4. *Mesogomphus reinwardti reinwardti* (SELYS), left side of penis (Java) and *M. r. simplex*, subsp. n. (Sumatra), anal appendages of male, right side and ventral view.

Female (allotype, Medan). — Very similar to the male. No structural differences in vertex and occipital plate. The brown line at base of the labrum narrower, projecting in the middle. Black transverse band across vertical portion of frons also narrower: lower third of this portion yellow in colour. No pale spots among the ocelli. Occiput as in the male.

Wings slightly tinged with yellow and neuration dark reddish brown at base. Nodal index $\frac{8.14}{9.11}$ $\frac{15.8}{11.9}$. Pterostigma jet-black, > 3 mm.

Thorax with pale markings not different from the male. Abdomen more robust, similar in form to that of Javan *reinwardti*; pattern scarcely different from that of the opposite sex. Base of segm. 8 with two rather large, but well separated orange spots on dorsum; 9 and 10 black, the former with small rounded orangish dots laterally, tergal margins black. Vulvar scale as in typical *reinwardti*.

Length: ♀ abd. + app. 32, hind wing 27 mm.

Appears easily distinguished from *M. capricornis* (FOERSTER) from the Malay Peninsula — a species not known to me — by (1) its larger size, (2) the dorsal thoracic stripes being connected with the mesothoracic half collar, (3) the toothed genital hamule, and (4) the less strongly curved superior anal appendages of the male.

After conscientious mutual comparison I have come to the conclusion that the Sumatran *Mesogomphus* is best linked up to the Rassen- or Formenkreis (sensu RENSCH-KLEIN-SCHMIDT) to which the Javan *reinwardti* also belongs. Since the latter is the first described member of this group the other Sondaic representatives will have to be designated in accordance with the rules of the trinomial system, viz. as subspecies subordinate to that name. *M. reinwardti simplex* m. is the first to be denoted in this way. Although it has not been discovered so far, the existence of a true *Mesogomphus* in Borneo is not questionable: it may either constitute a distinct species or turn out to be a participant of the Rassenkreis *reinwardti*.

In a future paper I hope to deal with a few equivalent instances among malayan Gomphidae, hitherto regarded as isolated species, whose relationships are better understood when considering them as geographical units of a single Rassenkreis. However, I am well aware of the many difficulties that occur in working out this fascinating problem, because distinctive characters, such as the thoracic colour-pattern, either appear very constant within the limits of a certain geographical unit (members of genus *Ictinus*, *Microgomphus*, *Heliogomphus*, and also *Onychogomphus*), or are so obviously variable (i.e. Javan *Onychogomphus geometricus* SEL. and *Macrogomphus parallelogramma* SEL.) that there is no

question about their different origin and only apparent equivalence. Accordingly, every species will have to be searched upon independently, and often along different lines of thought.

Mesogomphus flavohamatus (MARTIN).

1921. MARTIN, Ann. Soc. ent. France, 90, p. 95. — ♂ ♀ „Florès, Bouru, Lombock" (*Onychogomphus*).

Material examined: — One male, one female (both adult), Flores, Fruhst[orfer] (pink label), *Onychogomphus* n. sp. Selys (both labels in DE SELYS' handwriting) in Mus. Brussels.

Male (type). — Head large, 7.5 mm broad (*reinwardti* 7 mm). Mouth-parts and face vivid ochreous yellow with reduced dark markings, as follows: tips of mandibles black; a short, oblique, diffuse brownish line on each side along anterior margin of postclypeus; a thick, short, black streak in front of frons restricted to its median third and finely connected above with a longitudinal stalk arising from the black band at base of the upper surface of frons. Vertex wholly black. Occipital plate darkened, with traces of some pale colouring at base and without any indication of teeth along its free margin. Occiput black, with a very broad ochreous yellow band along margin of compound eyes, below. Eyes dark brown.

Prothorax black with two ochreous side spots and a narrow yellow streak on mid-dorsum. Thorax vivid ochreous on a deep black background, markings very sharply delimited (fig. 3c). Venter entirely yellow.

Coxae clear ochreous as are also the femora; the apical fourth to fifth of the latter darkened, almost black; tibiae and tarsi all black.

Wings hyaline, neuration black. Pterostigma jet-black, much longer and decidedly narrower than in the other species, scarcely less than 4 mm long. Anal triangle four-celled.

Nodal index $\frac{9.15}{11.13} \quad \frac{15.9}{11.9}$

Abdomen black, with rich ochreous markings, as follows. Segm. 1—2 similar to *reinwardti* but with longitudinal mid-dorsal yellow band on 2 narrower and side-markings enlarged, including the auricles, which are not margined with black; this spot separated from the lateral mark on first segment by a black streak roundabout the segment. Basal three-fifths to two-thirds of segm. 3—7 bright ochreous; these markings not narrowed apically, as is the case in *reinwardti*, but straight cut off and only irregularly indented laterally, the pale colouring of the sides thus covering an equal space as it does above, with the exception of a black latero-basal spot on each side of these segments (in *reinwardti* it is just this latero-

basal portion of the segment that remains yellow). Longitudinal and transverse sub-basal carinae of segm. 3—7 finely black. Segm. 8 with a transverse black band along base, and a subtriangular ochreous spot on dorsum, pointed behind and confluent with the bright ochreous foliate expansions. These better developed than in *reinwardti*. Dorsum of 9 black with four indistinct reddish spots; sides wholly ochreous. Segm. 10 entirely unmarked: only mere traces of two black dorsal spots along extreme base.

Anal appendages entirely orange. Superior pair of the usual shape, long and slender. Distal third of inferior appendix strongly upwardly curled at apex, but less so than in *reinwardti*, only shallowly indented apically.

Genitalia but little different from *reinwardti*, black. First hamule a little longer and less outwardly curved at apex; second hamule with upper tooth-like projection situated decidedly more apicad. Penis not visible.

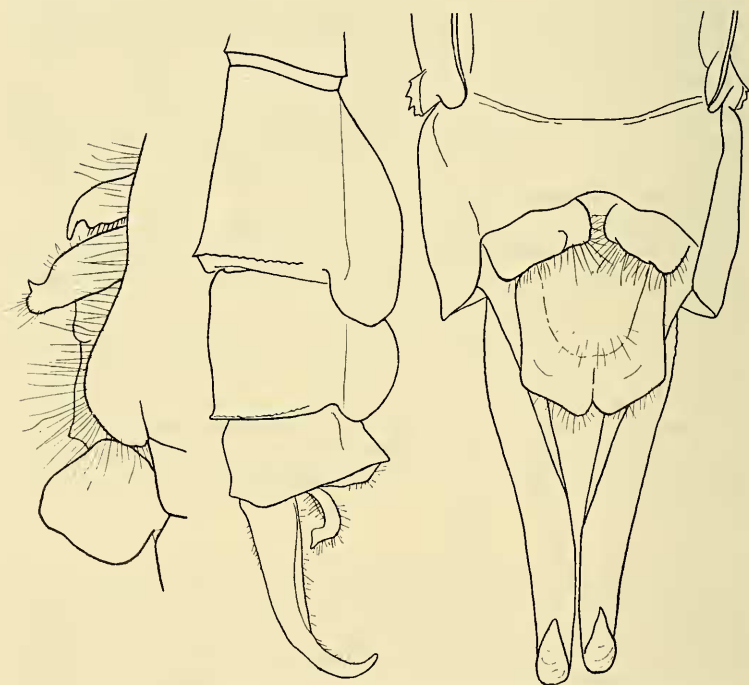


Fig. 5. *Mesogomphus flavohamatus* (MARTIN) (Flores). Genitalia, left side, and anal appendages of male, right side and ventral view.

Female (allotype). — Very similar to the male but appreciably stouter and with the head still wider (8 mm, *reinwardti* 7 mm). Labrum with a very diffuse, dark ferruginous basal patch. T-spot on frons still more reduced, its transverse

portion very narrow. Vertex with some ill-defined dark ochreous points among the ocelli. Occipital plate dull orange, provided along its free margin with a single minute denticle on left side only.

Prothorax with mid-dorsal transverse yellow bar larger than in the male. Markings on upper side of synthorax identical, but the dark confluent lateral stripes are rather obliterated and not sharply delimited from the pale ground-colour.

Legs as in the opposite sex.

Wings clear, longer and more pointed than in *reinwardti*, faintly tinged with golden yellow in subcostal and cubital spaces, as far out as second antenodal cross-vein. In left front wing two pairs of these cross-veins are incidentally connected with each other by a longitudinal vein; in right front wing one pair is so. Pterostigma very long and narrow, almost 5 mm, scarcely widened in the middle and jet-black in colour.

Nodal index $\frac{9.18.}{10.11.} \frac{17.8}{11.11.}$

Abdomen thick and robust. Pale markings enormously enlarged, occupying scarcely less than three-fourths of segm. 3—7 (the sixth segment is wanting). First segment with two black spots on dorsum only; segm. 2 with median longitudinal yellow band bordered on either side by a narrow, ill-defined, brown streak, the sides being wholly yellow and traversed longitudinally by a narrow, broken, black line. The basal black spots at the sides of segm. 3—7 are a little larger than in the male. Basal half of segm. 8 orange on dorsum, enclosing a black spot at extreme base; the pale colouring broadens to behind along side, covering the entire lower portion of the tergite. Dorsal two-thirds of 9 black, the remainder orange. Segm. 10 and anal appendages unicolorous bright orange, as in the male.

Vulvar lamina not different from the other species.

Length: ♂ abd. + app. < 36, hind wing 27.5; ♀ ca. 36.5. 31 mm.

This richly coloured insect stands quite isolated among its congeners of eastern distribution and is of considerable interest on account of its being only remotely allied to the dark species from Soemba, described below as *tachyerges* m. It is remarkable for its large 7-shaped thoracic bands, and for the shape of the inferior anal appendage of the male, the very long pterostigma of the female being also very characteristic.

A redescription of this fine insect, so cursorily described by RENÉ MARTIN, did not seem to me to be out of place, the more so as LAIDLAW in his „Synonymic list of dragonflies of the family Gomphidae found in the Oriental Region" (Trans. Ent. Soc. London, 78, 1930) makes no mention of it.

The couple in the Brussels Museum fits well in with MAR-

TIN's diagnosis, although no mention has been made of any of its structural characters except of the male anal appendages which are laconically reported to be „courbés en bec d'aigle, les inférieurs du quart, redressés". The thoracic sides of the typical male are said to be : „jaunes parsemés de traits noirs en zigzag", but there remains scarcely any doubt that our present examples are conspecific with MARTIN's. This author's statement of *flavohamatus* being found in „Flores, Bouru, Lombok" lends some countenance to the idea that MARTIN may probably have examined more than one species ! Its occurrence in Boeroe (Moluccas) needs confirmation, and, to say the least of it, appears rather doubtful to me.

We are anxiously looking forward to the discovery of this or other species of *Mesogomphus* in the remaining Lesser Soenda Islands, and in the Moluccas.

Mesogomphus tachyerges, sp.n.

Material examined : — Four males (adult), East Soemba, Kananggar, 700 m alt., Waidjelo River, V. 1925. K. W. DAMMERMAN leg.

Male (type). — Head 7.5 mm broad. Labium clear ochreous, median lobe and tips of lateral lobes finely bordered with black. Genae and mandibles similar in colour, apices of the latter black. Labrum greenish ochreous, narrowly margined with black and with a black, subtriangular, spot on the middle at base, pointed in front and touching the black apical border. Anteclypeus light green ; postclypeus black, with two large, subtriangular, green spots, one on each side, touching the eyemargin, and with a vestigial yellow spot in the middle at base. Vertical portion of frons jet-black ; upper surface with two well separated, oval, green spots along anterior margin, the remainder (incl. lateral edges) black. Vertex and occipital plate jet-black, as is also the occiput, except a minute, greenish point in front of each lateral ocellus. Ocellar ridge well pronounced, rounded. Posterior margin of occipital plate sharp, concave, sparsely fringed with dark brown hairs, unarmed. Eyes dark chestnut-brown. Occiput with a clear ochreous band along lower half of the margin of compound eyes.

Prothorax black, with a small yellow spot on each side above, and with a still smaller, median spot along posterior margin.

Synthorax throughout shining jet-black, marked vividly with grass-green spots and bands, as is shown in the figure. Venter dull ochreous with brownish sutures.

Coxae and outer half to three-fourth of femora clear ochreous ; mesally, the pale colour of the posterior pair of femora is traversed by two narrow, longitudinal, black lines, parallel to one another. Legs otherwise black.

Wings clear, membrane very faintly tinged with yellow. Neuration black. Anal triangle four-celled. Pterostigma very dark brown, almost black, slightly widened at middle, 3.3 mm long. Nodal index $\frac{10.13}{12.10}, \frac{15.9}{9.11}$.

Abdomen long and slender; terminal segments with leaflike expansions about as large as in *flavohamatus*. Coloration black with deep chrome yellow markings, turning to vivid orange on segments 8—10. Segm. 1 with the sides broadly yellow and a small dorsal spot of the same colour reaching from end to end. Segm. 2 has a large, dorso-lateral black patch on each side, enclosing a median hour-glass-shaped yellow marking, touching both ends of segment and slightly swollen in its middle, the black curving down anteriorly before the auricles, encircling the entire segment. Auricles pale, the posterior margin of segm. 2 bordered with black laterally. Genitalia all black. Segm. 3—6 have large, deep yellow, dorsal markings occupying a little more than the basal half of each segment, but are quite different in shape from any other species, except perhaps *capitatus* MARTIN. These spots are not widened basally, but almost parallel-sided, and each is divided up into four spots by a median longitudinal black line and a similar, transverse, sub-basal line. Laterally, each of these markings is broadly surrounded by black, the basal two-thirds of the tergites being again spotted with yellow along their margin. Segm. 7 with a very large ochreous yellow marking roundabout, indented by black from behind along both sides and rather pointed on mid-dorsum; distal third of segment black. Segm. 8 mostly vivid ochreous, with a thick, angulated, black spot projecting on each side from the posterior margin to in front, a little before middle of segment; these spots confluent along hinder margin. Foliate dilatations bordered with black behind. Segm. with a black anterior stripe and black latero-apical black spots similar to 8, and with the foliate dilatations also black along margin. Segm. 10 bright ochreous, the basal and apical margins finely black.

Superior anal appendages comparatively long and slender, dull ochreous brown at base, distal two-thirds much darkened. Appendix inferior only slightly upcurved, yellow in colour (fig 6).

Genitalia but little different from *reinwardti* and *flavohamatus*. Hamulus slenderer, with apical tooth still better developed than in *flavohamatus* and decidedly more pronounced than in *reinwardti*. Distal joint of penis more elongate and without the dorsal tubercular swelling as found in the latter species (fig. 6).

Length: abd. + app. 37, hind wing 28 mm.

Paratypes. — The other specimens are scarcely dif-

ferent from the type. In one male the occipital plate is entirely black, whereas in two others each of these spaces bears a distinct yellow spot. In all examples the inner surfaces of femora are blackish and in one specimen the abdominal markings are a little more reduced. Finally, one male has its upper appendages throughout dull ochreous.

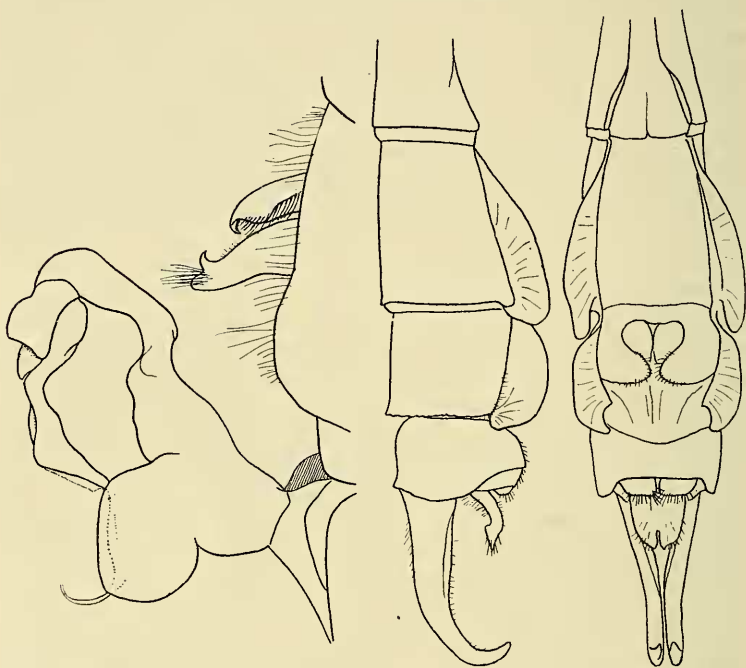


Fig. 6. *Mesogomphus tachyerges*, sp. n. (Soemba). Genitalia, left side and anal appendages of male, right side and ventral view.

The smallest specimen measures abd. + app. 35, hind wing 25; width of head 7.2 mm. Nodal index $\frac{8.14}{9.9}$ $\frac{13.9}{9.9}$

Female unknown.

There is only one species with which this fine insect might bear some resemblance, viz. *M. capitatus* (MARTIN), described from Celebes. I have not seen this species and it was not possible to send me the unique male for comparison and study. It is chiefly characterized by its much larger size and by the shape of the appendix inferior („L'inférieur très divisé en deux branches, recourbées en haut, de moitié des supérieurs", MARTIN, Bull. Soc. ent. Ital. 60, 1908, pp. 199—200).

Along the banks of the Waidjelo River *M. tachyerges* was met with in company with the following other species of Dragonflies: — *Euphaea lara* KRÜGER, *Rhinocypha*

braueri FOERSTER, *Pseudagrion pilidorsum* (BRAUER),
Notoneura selysi (FOERSTER), *Trithemis aurora* (BURM.),
T. lilacina FOERSTER, and *T. festiva* (RAMB.).

Genus *Onychogomphus* Selys.

Onychogomphus modestus modestus SELYS.

1879. SELYS, 4e Add. Synopsis des Gomphines, pp. 18—19 sep. —
 Hab.: ? Bengal.

1924. FRASER J. Bombay Nat. Hist. Soc. 30, pp. 109—110. pl. 1 fig. 1,
 textfig. 2³ and 2¹⁰. — Hab.: Darjeeling Distr. (*O. diminutivus*).

Material examined: — Two males (one in perfect condition), labelled: „Atkinson” (SELYS' handwriting) under the drawer-label *O. modestus*. Mus. Brussels.

An examination of these two examples, one of which has doubtless to be considered as the type of SELYS's species *modestus*, has brought to light that de Selys's description of the inferior anal appendage of this insect is incomplete. The passage in the original description runs as follows: — „Appendice inférieur brun foncé, étroit, un peu recourbé en haut, canaliculé, profondément divisé en deux branches contigues, mousses”. In both specimens each of the branches of the appendix inferior is provided with a very distinct, acute tooth situated a short distance before the apex. This tooth is a little shorter than that figured in the present paper for *modestus fruhstorferi*, but otherwise is very similar. On the other hand in both specimens the upper margin of the appendix inferior in side view appears smoothly curved from base to subapical tooth, and is thus devoid of a sub-basal tubercle, as is seen in the insular subspecies.

To the original description no further additions or corrections are required. From these statements it will be at once evident that FRASER's species from the Darjeeling District, named by him *diminutivus* can neither be regarded as specifically distinct from *modestus*, nor even as a subspecies of it.

Accordingly, the last of the two following quotations has been proven to be correct. FRASER 1924 (loc. cit., supra, p. 110): — „..... but I do not think it at all possible that the spines on the inferior appendage could have escaped the notice of Selys if they had been present in *modestus*”.

RIS 1927 (loc. cit., infra, p. 46): — „Fraser (51), der auch *modestus* nicht aus Autopsie kennt, vertraut die Originalbeschreibung mehr als ich und beschreibt einen neuen *O. diminutivus*, dessen Appendix inferior den distalen Zahn, nicht aber den proximalen Höcker unseres Expls. trägt. Es werden da einst die Typen zu vergleichen sein, besonders aber auch festzustellen wie weit etwa die Verbreitungskreise und die Variabilität solcher indischer Gomphinen reichen. Darüber weiss man noch fast nichts”.

Onychogomphus modestus fruhstorferi, subsp. n.

1927. RIS, Zool. Mededeel. Leiden, 10, 1, pp. 30—31, 46, fig. 19—21.
 — Hab.: Centr. Sumatra, Korintji (*O. modestus*, forma).

Material examined : — One male (ad.), labelled : Java Fr. ♂, and *Onychogomphus Fruhstorferi* ♂ Java (in SELYS's handwriting), in Mus. Brussels. Two males (ad.), East Java, Besoeki, G. Raoeng, Bajoekidoel Est., ca. 500 m alt., V. — VI. 1931, and I. 1932 H. LUCHT leg., in Mus. Buitenzorg.

Very closely allied to *modestus* SELYS and considered by the present author as the insular representative of the same species. Differs by the slight reduction of the pale colouring of the body, and by the presence of a distinct sub-basal tubercle along upper margin of the branches of inferior appendage in the male.

Male (holotype Java, Mus. Brussels). — Labium whitish, tips of lateral lobes and distal border of median lobe black. Mandible-bases clear yellow. Labrum shining black with an oval yellow spot on each side touching the lateral margin. Anteclypeus dull yellowish, darkened aside. Postclypeus black with a small yellow spot upon the middle of each of the lateral expansions. Frons in front black, the upper surface likewise black but decorated anteriorly with two slightly crescent-shaped, green stripes, lying side by side and but narrowly separated from each other in the median line. Antennae and the whole dorsal surface of head black. No pale markings along the eye-margin. Occiput black.

Prothorax black, except two yellow spots, one on each side, on the anterior strips just in front of the anterior lobe.

Synthorax black, with grass-green markings exactly similar in shape and size to those figured by RIS for a Sumatran specimen (loc. cit. fig. 21). Venter of thorax wholly green.

Legs black; the posterior two-thirds of exterior surfaces of all coxae, and a thick stripe along trochanters and inner side of first pair of femora, green. Femora of third pair reaching as far back as a trace before hinder margin of first abdominal segment.

Wings hyaline, very faintly tinged with yellow, this colour slightly deepened in the antero-basal portion of the wing. Nodal index $\frac{8.12}{8.9}$ $\frac{12.9}{8.7}$. Anal loop of left hind wing free, of the right two-celled; proximal to it two undivided postanal cells; postanal field of front wing with one row cells. Pterostigma very dark chestnut-brown.

Abdomen very slender, with intermediate segments very narrow and cylindrical, otherwise shaped as for genus. First segment blackish above, largely green aside. Segm. 2 black with a longitudinal greenish stripe over the middle of dorsum, not reaching hinder margin, with the auriculae largely green, and with an elongate greenish side-marking touching

the lateral and posterior margins of segment. Segm. 3—10 jet-black, marked with yellow, as follows. Base of 3 with very small, broadly triangular, yellow spot, and a fine, mid-dorsal longitudinal yellow line restricted to the middle of the dorsum. Segm. 4—6 with vestigial, transverse, dorso-lateral yellow spots at their extreme bases, and 7 with a clear yellow basal ring, reaching downwards almost to the lateral margin of segment, occupying scarcely more than one-fourth of its length. Segm. 8—10 entirely black.

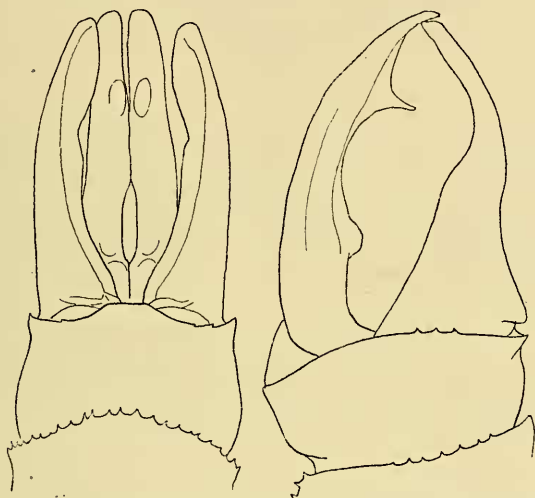


Fig. 7. *Onychogomphus modestus fruhstorferi*, subsp. n. (Java). Anal appendages of male, right side and dorsal view

Genitalia shaped exactly as in the Sumatran example, figured by RIS (loc. cit. fig. 20). Vesicle of penis shining black.

Anal appendages about equal in length to segm. 9 + 10. The superiors clear yellow to a little over half of their length, thence rather suddenly fading to dark brown or black. Inferior appendage scarcely longer than superior pair, dark reddish brown at base, growing darker towards apices. Each of the branches with a very distinct, rounded, sub-basal tubercle and with a narrow, spine-like, sub-apical tooth (fig. 7).

Length: abd. + app. 29.5, hind wing 21.5, pt. $\frac{2.8}{2.8}$ mm.

Male (paratypes, ad., Bajoekidoel). — One of these differs from the type specimen only in having the yellow spots on abdomen very little larger: third segment with the small triangular basal spot narrowly continued to behind, forming a fine longitudinal mid-dorsal line, slightly widened at the middle of the segment but tapering to behind and leaving off much before the posterior margin. Fourth segment with

very short, isolated yellow line along median carina. Basal yellow spot on segm. 7 similar in size to the type in both specimens. Nodal index $\frac{8.14.16.9}{9.9.10.9}$ and $\frac{11.13.13.9}{9.10.10.9}$. Anal loop two-celled in both hind wings; in the second male the loop is formed by three cells, the lowermost being largest and somewhat irregular.

Size decidedly larger. Length: abd. + app. 31, hind wing 23—24, pt. 3 mm.
